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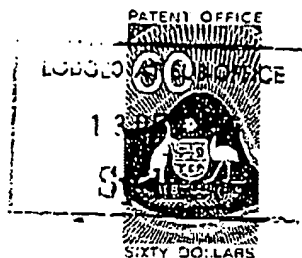
FORM 1

SPRUSON &amp; FERGUSON

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

APPLICATION FOR A STANDARD PATENT



We, PDL PACKAGING LTD of 19 Keeling Road, Henderson, Auckland,  
New Zealand, hereby apply for the grant of a standard patent for  
an invention entitled:

TAMPER PROOF SEAL FOR A CONTAINER CLOSURE

which is described in the accompanying provisional specification.

Our address for service is:-

Spruson & Ferguson  
Patent Attorneys  
Level 33 St Martins Tower  
31 Market Street  
Sydney New South Wales Australia

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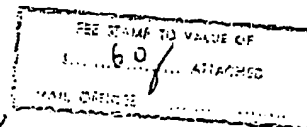
13 DEC 1985

Sydney

DATED this THIRTEENTH day of DECEMBER 1985

PDL PACKAGING LTD

By:

Registered Patent Attorney

TO: THE COMMISSIONER OF PATENTS  
AUSTRALIA

APPLICATION ACCEPTED AND AMENDMENTS  
ALLOWED 1-2-90

JH/1339z

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SPRUSON &amp; FERGUSON

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

DECLARATION IN SUPPORT OF AN  
APPLICATION FOR PATENT

In support of the application made by PDL Packaging Limited, for a patent for  
an invention entitled:

"Tamper Proof Seal For A Container Closure"

I/We, ANTHONY WAYNE SEABAR, GENERAL MANAGER PDL PACKAGING LTD.  
[full name of declarant(s)]  
of 2/10 MAHARA AVE BIRKENHEAD AUCKLAND N.Z.  
[full address of declarant(s) - not post office box]

do solemnly and sincerely declare as follows:

1. We are authorised by PDL Packaging Limited, the applicant for the patent to make this declaration on its behalf.
2. Richard James, Tierney, of 15 Illawong Avenue, Caringbah, NSW 2229, AUSTRALIA, and Robert Clifford Brown of Anzac Valley Road, Waitakere, Auckland NEW ZEALAND, are the actual inventors of the invention and the facts upon which the applicant is entitled to make the application are as follows:-

The applicant is the assignee of the invention from the actual inventors.

DECLARED at Auckland this 21<sup>ST</sup> day of JUNE 1990  
N.Z.

[Signature]  
Signature of Declarant(s)

TO: THE COMMISSIONER OF PATENTS  
AUSTRALIA

KLN/24461

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(12) PATENT ABRIDGMENT (11) Document No. AU-B-66495/86  
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 602500

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(54) Title  
CLOSURE WITH STRONG TAMPER-PROOF BAND

International Patent Classification(s)  
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(60) Related to Provisional(s) : PH3865

(71) Applicant(s)  
PDL PACKAGING LTD.

(72) Inventor(s)  
RICHARD JAMES TIERNEY; ROBERT CLIFFORD BROWN

(74) Attorney or Agent  
SPRUSON & FERGUSON, GPO Box 3898, SYDNEY NSW 2001

(56) Prior Art Documents  
AU 54452/86 B65D 55/12  
AU 87442/82 B65D 55/12  
AU 55194/80 B65D 55/12

(57) Claim

1. A tamper proof seal and container closure device  
including, in combination;

a seal ring without an integrally formed or associated  
tear tab, and a screw threaded closure, said seal ring being  
provided on its inner face with at least one recess and at  
least one stop, said closure being provided with at least one  
projection on the lower edge of the closure, said projection  
being adapted to fit within the recess of the seal so that  
when in combination with the seal ring and closure fitted to  
a bottle neck the stop on the seal ring locks the seal ring,  
closure and bottle neck together against normal or forced  
unscrewing until the seal ring is cut and removed.

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FORM 10

SPRUSON &amp; FERGUSON

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

COMPLETE SPECIFICATION

(ORIGINAL)

FOR OFFICE USE:

Class Int. Class

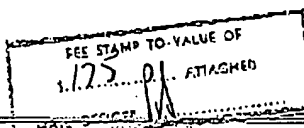
Application Number: PH3865

Lodged: 66495/86. 13 December 1985

Accepted:  
Published:

Priority:

Related Art:



Name of Applicant: PDL PACKAGING LIMITED

Address of Applicant: 19 Keeling Road, Henderson, Auckland, New Zealand

Actual Inventor: Richard James Tierney and Robert Clifford Brown

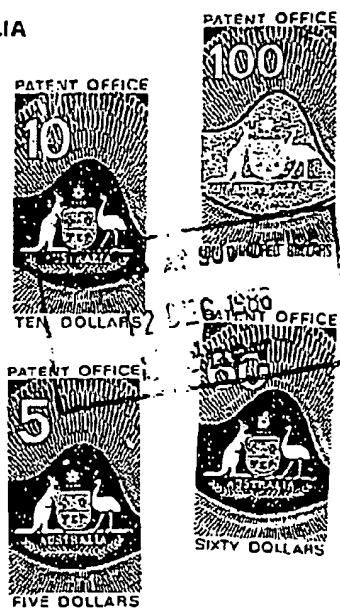
Address for Service: Spruson & Ferguson, Patent Attorneys,  
Level 33 St Martins Tower, 31 Market  
Street, Sydney,  
New South Wales, 2000, Australia

Complete Specification for the invention entitled:

TAMPER PROOF SEAL FOR A CONTAINER CLOSURE

The following statement is a full description of this invention,  
including the best method of performing it known to us

DG/108F



The present invention relates to tamper proof seals for closure devices, and in particular to a tamper proof seal for tamper proof closure devices used on containers housing dangerous substances in which the seal must be broken with the aid of a tool in order to open the container.

Prior art child proof seals for closures exist but only prevent a child, with little strength and little know-how, from opening a container. Such seals are sufficient when the only risk is that a child would unknowingly attempt to open a container housing a dangerous substance. Other circumstances exist when an adolescent or even an adult, would purposely try to open the container, in say a shop, with the intent to do harm or to misappropriate the contents. A seal for a closure device is therefore needed, which will be able to be broken readily but only with the correct tools and in such a manner so as to attract attention to the broken seal when the container has been opened.

It is an object of the present invention to overcome or substantially ameliorate the abovementioned disadvantages.

In accordance with one aspect of the present invention there is provided a tamper proof seal and container closure device including, in combination;

a seal ring without an integrally formed or associated tear tab and a screw threaded closure, said seal ring being provided on its inner face with at least one recess and at least one stop, said closure being provided with at least one projection on the lower edge of the closure, said projection being adapted to fit within the recess of the seal



so that when in combination with the seal ring and closure fitted to a bottle neck the stop on the seal ring locks the seal ring, closure and bottle neck together against normal or forced unscrewing until the seal ring is cut and removed.

The combined seal ring and closure can be locked onto the bottle neck by the interaction between the stop on the seal and a complementary stop formed on the side of the base of the bottle neck.

Each projection can have a tapped region which extends out from the outside wall of the closure to form a latch which co-operates with a step on the edge of the recess to locate the closure and seal ring together.

The seal ring can be formed as an annular skirt with either a base ring, middle ring and top ring or only a base ring and top ring.

The annular skirt with base ring, middle ring and top ring can have its base ring with an internal diameter designed to fit over the base of the bottle neck, its middle ring with an internal diameter similar to the internal diameter of the closure and its top ring has an internal diameter designed to engage with the base of the closure.

The annular skirt with only a base ring and top ring has the base ring with an internal diameter designed to fit over the base of the neck and the top ring has an internal diameter designed to engage with the base of the closure.



The seal ring can have the side wall thereof reduced in thickness and height at one point to produce a more easily cut region for assisting in removal of the seal ring.

5        Preferably the combination is such that to release the closure the seal must be cut to allow the closure to pass over the stop at the base of the neck and rotate relative to the neck to thereby release the closure.

10        Further advantages of the invention will become apparent from the following embodiments given by way of example only.

Embodiments of the present invention will now be described in detail, by way of example only, with reference to the accompanying drawings, in which:

15        Figure 1 is a top plan view of the seal of the present invention;

Figure 2 is a side view partly sectioned of the seal of Figure 1;

20        Figure 3 is a view from below of the seal of Figures 1 and 2;

Figure 4 is a plan view on an enlarged scale of the region X referred to in Figure 1;

Figure 5 is a view in the direction of arrow Z shown in Figure 2 of part of the seal ring;

25        Figure 6 is a plan view from below, on an enlarged scale, of the region Y referred to in Figure 3;

Figure 7A is a section, on an enlarged scale, at point A-A on the periphery of the seal shown in Figure 1;

Figure 7B is a section on an enlarged scale at point B-B on the periphery of the seal shown in Figure 1;

Figure 7C is a section on an enlarged scale at point C-C on the periphery of the seal shown in Figure 1;

5        Figure 8 is a top plan view of the neck of a bottle suitable for use with the seal of Figures 1 to 7C and Figures 8 and 9 respectively;

Figure 9 is a side elevation of the neck of the bottle of Figure 8;

10       Figure 10 is a perspective view of a cap suitable for use with the seal and the bottle neck of Figures 1 to 9;

15       Figure 11 is a top plan view of an alternative seal ring usable with the bottle neck and closure shown in Figures 8 to 10;

Figure 12 is a view from below of the seal ring shown in Figure 11;

Figure 13 is a side view of the seal ring shown in Figures 11 and 12;

20       Figure 14 is a plan view of the seal ring on an enlarged scale of the region W shown in Figure 11;

Figure 15 is a section on an enlarged scale at V-V on the periphery of the seal ring as indicated in Figure 11; and

25       Figure 16 is a section on an enlarged scale at U-U on the periphery of the seal ring as indicated in Figure 11.



In the first example shown in Figures 1 to 7C there is shown a seal 1 which, together with a bottle neck 2 of the type shown in Figures 8 and 9 and a cap of the type shown in Figure 10 constitute a combination tamper proof seal for a container closure device. The seal 1 is made of a rigid plastic material and is comprised of three main sections, the top ring 3, the middle ring 4 and the base ring 5 as shown in Figure 2.

The middle ring 4 is shown in Figures 1, 2 and 3. In the example the middle ring 4 has two recesses 6, 7 cut therein. The base ring 5 has cut into its inner periphery corresponding extensions 6', 7' to the recesses 6, 7 on the middle ring. The base ring 5 has a shaped stop 8 on its inner peripheral wall 9.

The middle ring 4 has a cut out 10 which with a reduced thickness portion 11 of the inner wall 9 of the base ring 5 forms a more easily cut region 13 for cutting the seal.

The seal 1 has extending outward from its outer wall 14 a pair of finger grips or indicating means 15 positioned on either side of a cut out 16. The outer wall 14 preferably has a V-shaped groove 17 which further reduces the thickness of the skirt wall of the seal.

The neck 18 of a bottle 2 for which the seal would be suitable, is shown in Figures 8 and 9. Figure 8 shows a stop 19 formed in the bottle neck 18 which co-operates with the shaped stop 8 on the seal 1. Figures 8 and 9 also show a thread 20 on the bottle neck.

A closure 21 which could be used in this closure device is shown in Figure 10 and is also preferably made of a rigid plastic material. It is provided with projections 22 on the lower edge 23 and finger grips 24 on either side of the closure 21. There is also a thread 25 provided on the inside of the closure 21.

The tamper proof seal and container closure device shown in Figures 1 to 10 of the present invention is operated as follows.

The seal 1 is placed in association with the closure 21 with the projections 22 within the slots 6, 7. The finger grips 24 fit within the slightly recessed regions 26 of the upper ring 3. The projections 22 preferably have a stepped region 31 which extends outward from the outer surface wall 14. The stepped region 31 co-operates with a step 32 (Figures 3 and 7B) to hold the closure 21 and ring 1 together for fitting or shipping. The combined closure and ring are then screwed onto the bottle neck until the shaped stop 8 locks over the complementary stop 19 on the bottle neck. The cam surface 27 of the stop 8 eases the edge 28 (Figure 6) of the stop 8 over the corresponding surface of the stop 19 while the closure is screwed into place. The locking engagement between the face 29 of the stop 8 and face 30 of stop 19 prevents unscrewing of the closure.

Once the seal 1 is in place with the closure 21 on the neck 2 the contact between the faces 29 and 30 will prevent the closure from moving backward (i.e. unscrewing).

The closure 21 is then securely held onto the neck 2 by the seal 1 and can not be released without the aid of a knife.

5 The seal 1 is provided with the indicating means 15 which indicate that the seal 1 should be cut at this point in order to release the closure 21.

10 Once the seal 1 has been cut the seal can be removed. The closure 21 can then be removed. Preferably the shape and dimensions of the projections 22 are such that unscrewing is not possible until opposite sides of the closure 21 are squeezed, as indicated at the finger grips 24 on opposite sides of the closure 21. This deforms the closure 21 slightly to allow the bottom of the projection to ride over the stop 19 to allow the closure 15 21 to be unscrewed.

In the alternative example of seal ring shown in Figures 11 to 16 the same parts as those shown in the first example are referenced by similar numerals.

20 In this construction the seal ring 1 consists of a base ring 5 and upper ring 3 which are moulded from a plastic material. The base ring 5 has a pair of recesses 6, 7 each of which has a lug or step 32 formed by an angled region 33 which begins from the top edge 34 of the upper ring 3. The base ring 5 also has two stops 8 one on 25 either side thereof. Each stop 8 has an arc shaped cutaway region 35 and adjacent thereto a chamfered region 36. The bottom edge 37 can have a plurality of grooves 38 which minimize material content in the seal 1.

The upper ring 3 has a pair of recessed regions 26 into which finger grips 24 fit when the seal 1 and closure 21 are fitted together.

5 The outside wall 14 of the seal ring 1 has a groove 17 cut therein to reduce the thickness of the wall where it is to be cut. The height of the wall at this cutting point is also reduced by the V-shaped cut out 39.

10 In use the closure 21 and seal ring 1 are clipped together by fitting the base 23 of the closure into the upper ring 3. The projections 22 slide in the slots 6, 7 until the latch 3 engages over the top or lug 32 in the slots 6, 7. The closure 21 is screwed onto a bottle neck 2 similar to that shown in Figures 8 and 9. The bottle neck 2 for this seal ring 1 and closure combination has a  
15 pair of stops 19 one on each side of the base of the bottle neck. The stops 19 are shaped to fit within the cutaway regions 35 of the seal ring 1. The provision of the chamfered region 36 aids the application of the combination to the bottle neck 2. As the cam region 40  
20 contacts the chamfered region 36 the opposite edges of the ring 1 and closure 21 rise slightly until the stops 19 fit within their respective cutaway regions 35. When locked together the closure cannot be released because of the interaction between the surface 29 and the edge 41 of the  
25 stop 8. Only when the ring 1 is cut can the closure 21 be released. As the projections 22 still extend below the level of the top of the stop 19 the closure cannot be released until the finger grips 24 are squeezed to deform

the closure 21 slightly and allow the bottom of the projections 22 to run over the top of the stops 19. This provides an additional child proof barrier even after the seal ring 1 has been removed.

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The foregoing describes only embodiments of the present invention and modifications, obvious to those skilled in the art, can be made thereto without departing from the scope of the appended claims.

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THE CLAIMS DEFINING THIS INVENTION ARE AS FOLLOWS:-

1. A tamper proof seal and container closure device including, in combination;  
a seal ring without an integrally formed or associated tear tab, and a screw threaded closure, said seal ring being provided on its inner face with at least one recess and at least one stop, said closure being provided with at least one projection on the lower edge of the closure, said projection being adapted to fit within the recess of the seal so that when in combination with the seal ring and closure fitted to a bottle neck the stop on the seal ring locks the seal ring, closure and bottle neck together against normal or forced unscrewing until the seal ring is cut and removed.
2. A tamper proof seal and closure device as claimed in claim 1 wherein the seal ring and closure are locked onto the bottle neck by the interaction between the stop on the seal and a complementary stop formed on the side of the base of the bottle neck.
3. A tamper proof seal and closure device as claimed in claim 1 or claim 2 wherein each projection has a stepped region which extends out from the outside wall of the closure to form a latch which co-operates with a step on the edge of the recess to locate the closure and seal ring together.
4. A tamper proof seal and closure device as claimed in any one of the preceding claims wherein the seal ring is formed as an annular skirt with either a base ring, middle ring and top ring or a base ring and top ring.



5. A tamper proof seal and closure device as claimed in claim 4 wherein the annular skirt has a base ring, middle ring and top ring with its base ring with an internal diameter designed to fit over the base of the bottle neck, its middle ring with an internal diameter similar to the internal diameter of the closure and its top ring has an internal diameter designed to engage with the base of the closure.

6. A tamper proof seal and closure device as claimed in claim 4 wherein the annular skirt has a base ring and top ring in which the base ring has an internal diameter designed to fit over the base of the neck and the top ring has an internal diameter designed to engage with the base of the closure.

7. A tamper proof seal and closure device as claimed in any one of the preceding claims wherein the seal ring has the side wall thereof reduced in thickness and height at one point to produce a more easily cut region for assisting in removal of the seal ring.

8. A tamper proof seal and closure device as claimed in any one of the preceding claims wherein the combination is such that to release the closure the seal must be cut to allow the closure to pass over the stop at the base of the neck and rotate relative to the neck to thereby release the closure.



9. A tamper proof seal and closure device as claimed in any one of the preceding claims wherein the closure has two projections which interfit with two recesses in the inner periphery of the seal ring and with a pair of stops formed on the side of the base of the bottle neck.

10. A tamper proof seal and closure device substantially as hereinbefore described with reference to either Figures 1 to 10 or Figures 11 to 16 of the accompanying drawings.

DATED this TWELFTH day of DECEMBER 1986

PDL PACKAGING LTD

Patent Attorneys for the Applicant

SPRUSON & FERGUSON



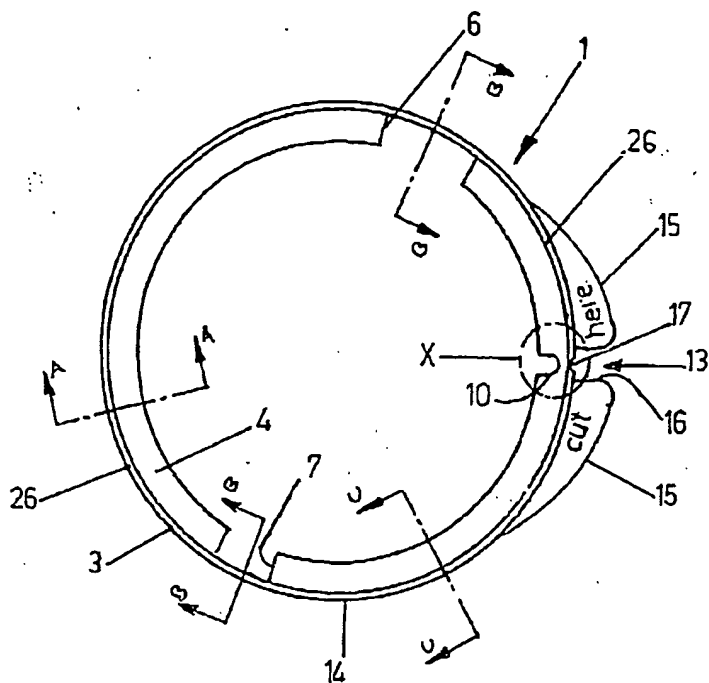


Figure 1

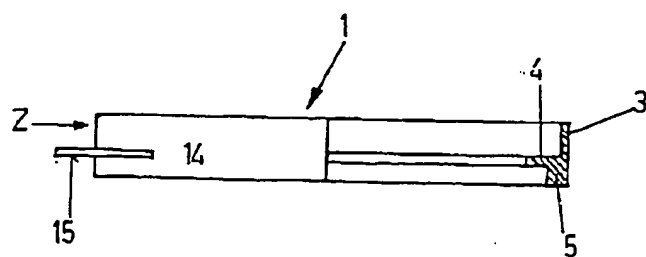


Figure 2

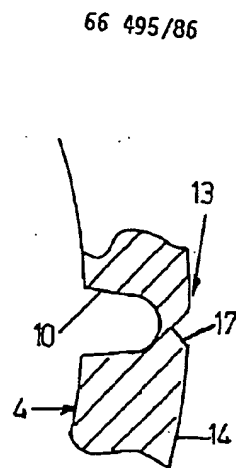


Figure 4

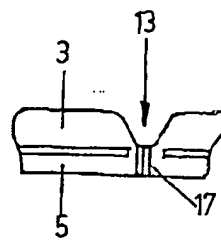
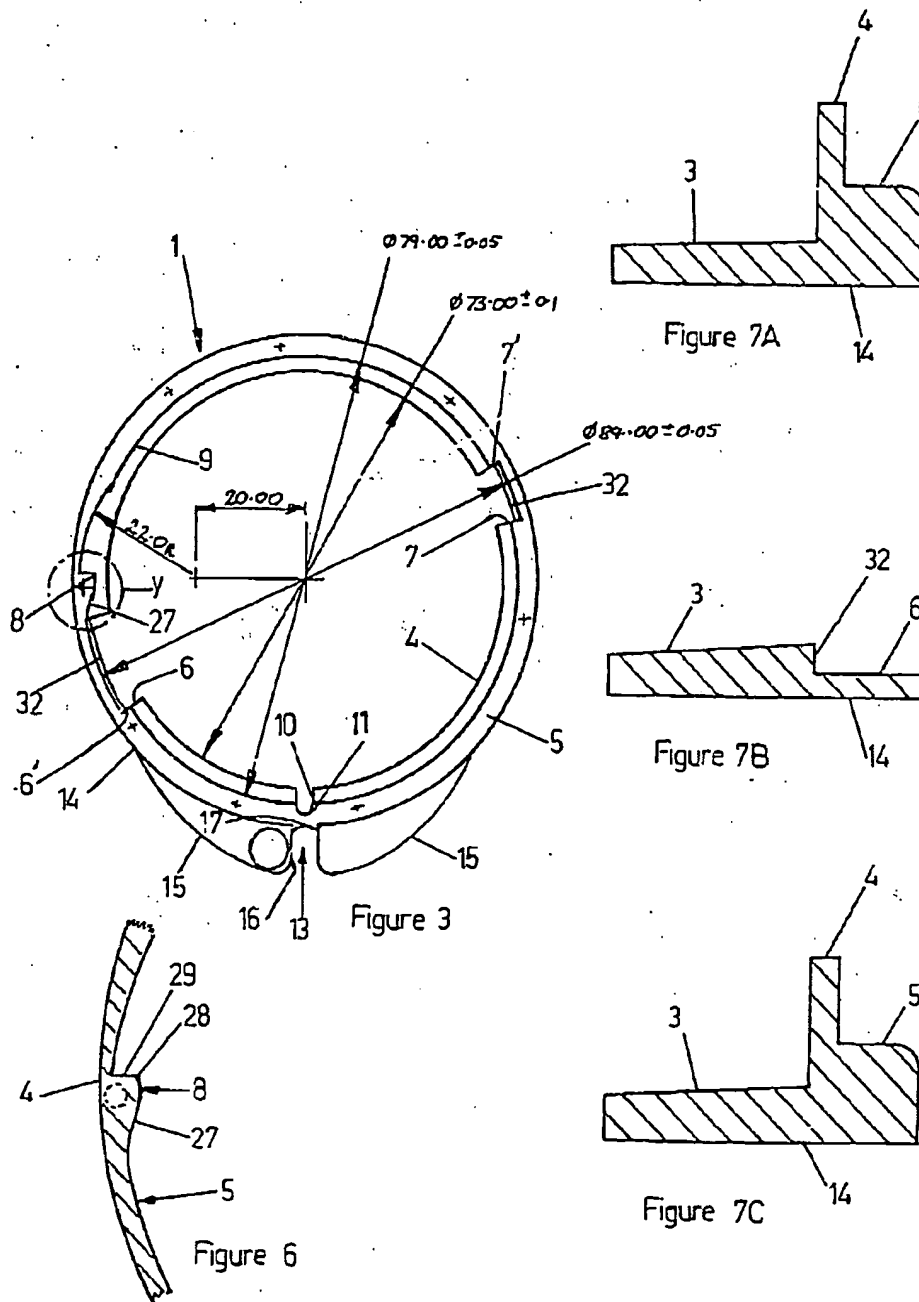
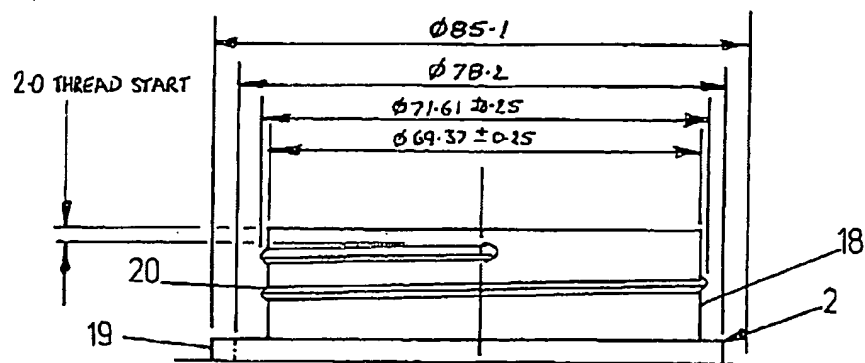
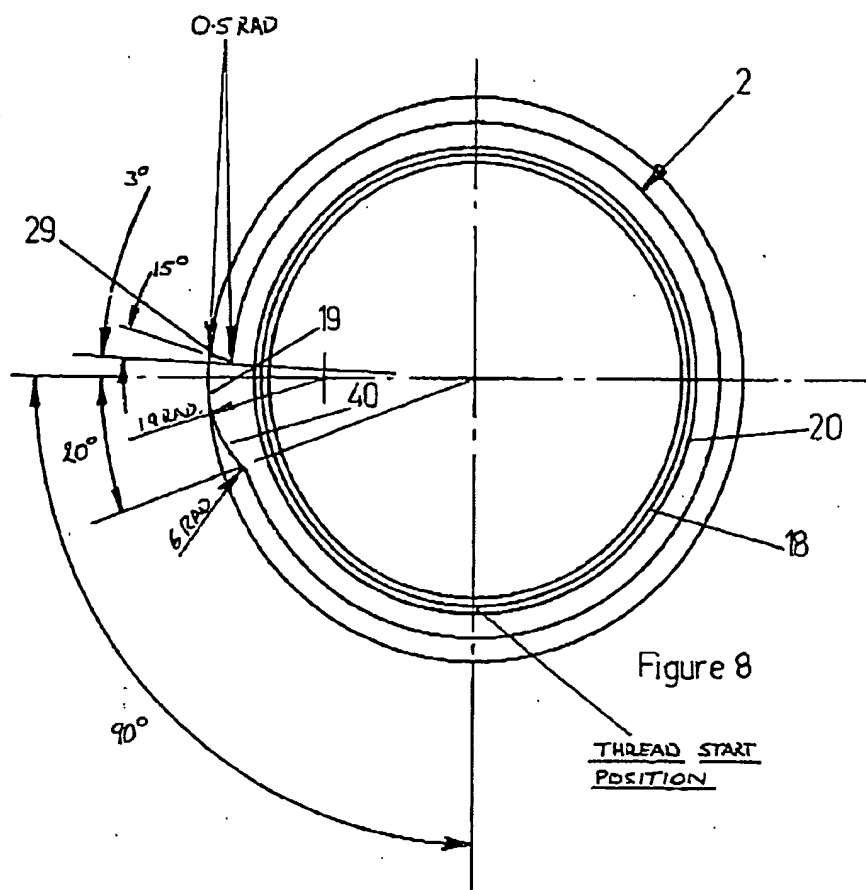


Figure 5





66495/86

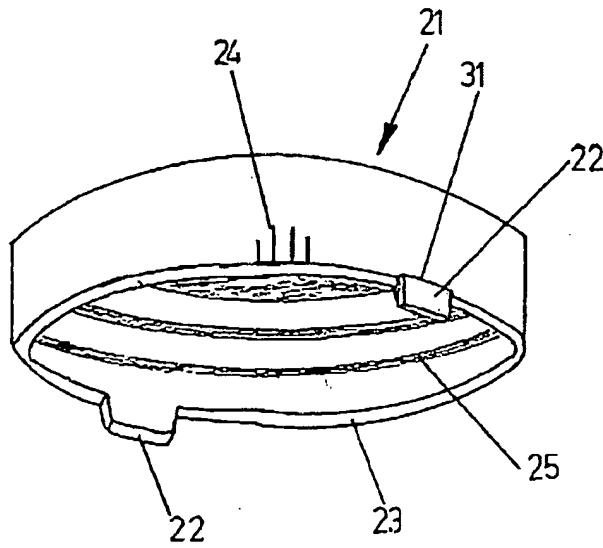
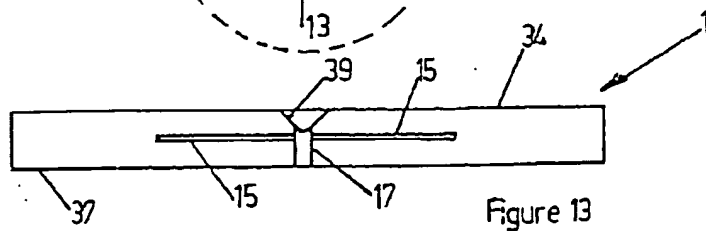
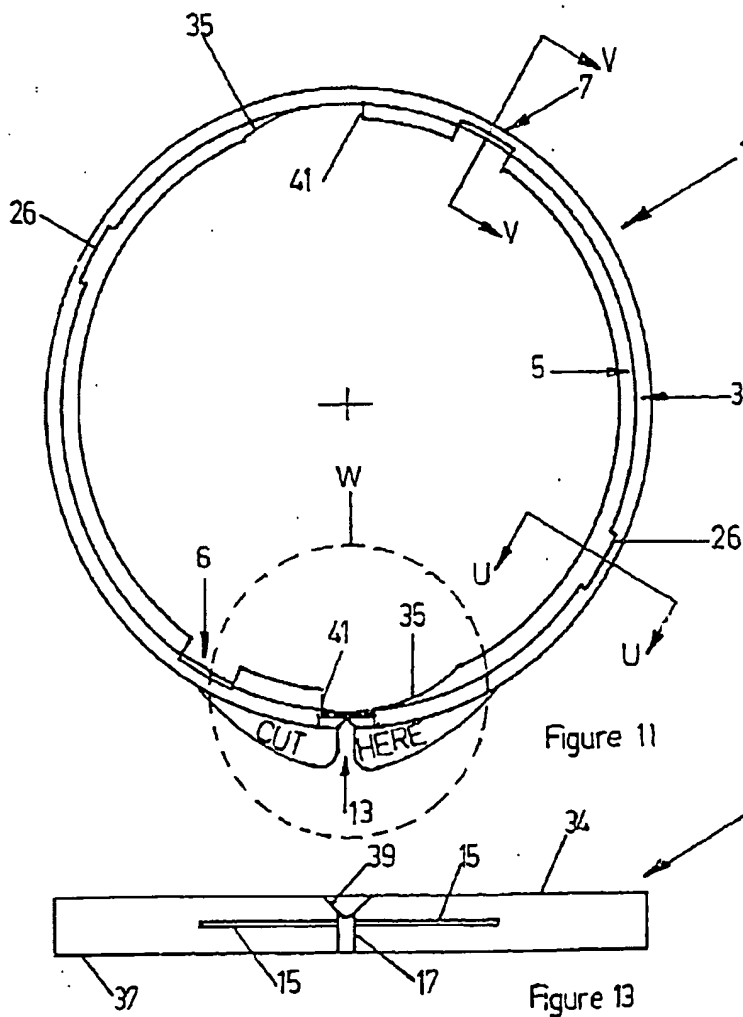
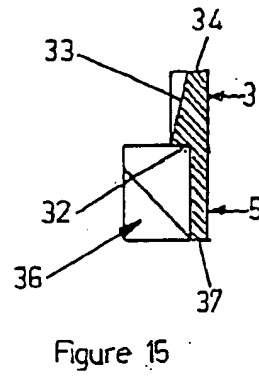
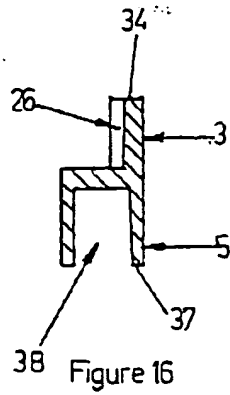


Figure 10



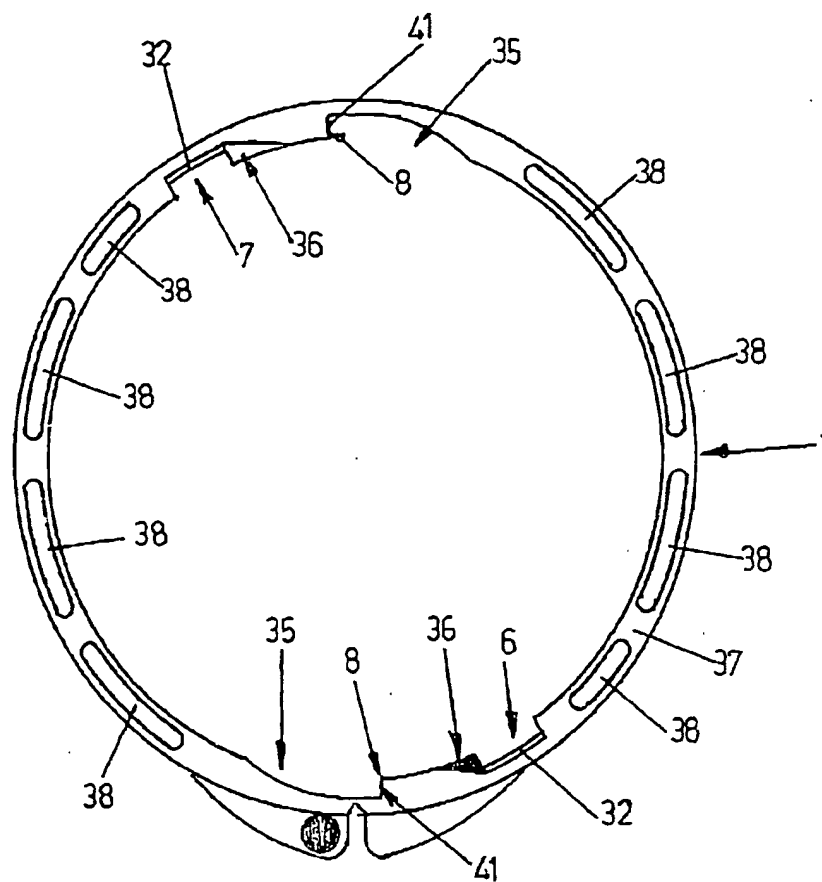


Figure 12

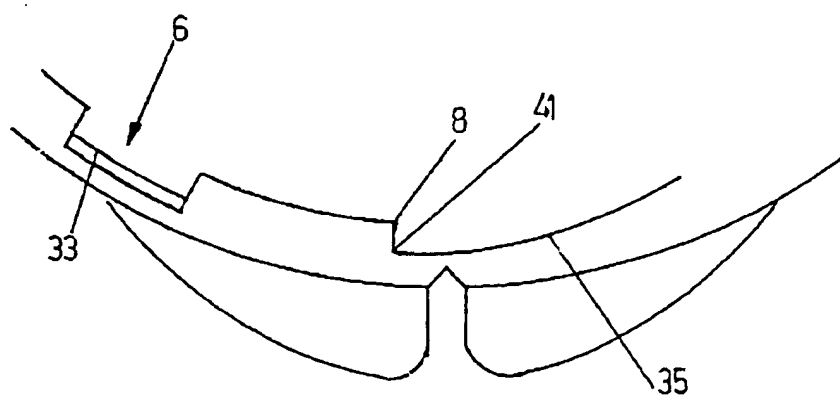


Figure 14

Application Id. : 66495 / 86

Serial Number : 602500

Relevant Act Patents Act 1990 (Transitional)  
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CDROM Presence  
Filing fee 175  
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Patentee Name  
Alto Plastics Limited  
Address : New Zealand

Inventor Name  
Richard James Tierney  
Robert Clifford Brown

Invention Title  
Closure with strong tamper-proof band

Full Title  
Tamper proof seal for a container closure

ATTORNEY ADDRESS  
SPRUSON & FERGUSON  
GPO Box 3898  
SYDNEY NSW 2001

## EXAMINATION DETAILS

Direction Date 17/02/88 Request Lodgement date 13/04/88  
Request Type Full examination following direction  
Request Fee Paid 210  
Deferment Date  
Examiner R J KIRBY  
Date Sent to Exam 27/07/90  
Search Results Requested  
Abstract Requested  
Re-exam request date  
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Abstract Received

## ACCEPTANCE DETAILS

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Amend to Apln  
Amend to Drwg  
Final date for Acceptance

Acceptance Advert Date 18/10/90

Opposition Date  
Opposition Result

*Now Accepted  
PAT. No. 602500*

Application Id : 66495 / 86

Serial Number : 602500

## Prior Art Documents

AU 54452/86 B65D 55/12  
AU 87442/82 B65D 55/12  
AU 55194/80 B65D 55/12

Date Sealed 26/02/91

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Accept Not Sealed Advert

Lapsed Advertised Date

Lapsed Type

Withdrawn Advertised Date

Withdrawn Type

Refused Advertised Date

Ceased/Expired Advert

## CHANGE OF PATENTEE DETAILS:

Assignment under S 187, Reg 19.1 : RECORD 1

Date of Request 14/11/95

Date of Registration 21/11/95

Instrument Date(s): 31/03/95

Date Parties Notified 05/12/95

Instrument Details:

Enclosures

Interest

Scope

Service Address

Certificate of Amalgamation

Certificate of Amalgamation

Full

Australia

SPRUSON &amp; FERGUSON

GPO Box 3898

SYDNEY NSW 2001

Old Name and Address:

PDL Packaging Ltd.

19 Keeling Road,

Henderson,

Auckland,

New Zealand

New Name and Address:

PDL Plastics Limited

19 Keeling Road,

Henderson,

Auckland,

New Zealand



Application Id : 66495 / 86

Serial Number : 602500

## CHANGE OF PATENTEE DETAILS:

Assignment under S 187, Reg 19.1 : RECORD 2

Date of Request 30/08/02

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Instrument Date(s): 31/10/00

Date Parties Notified 09/10/02

Instrument Details: Deed of Assignment  
Enclosures No enclosures on file  
Interest Full  
Scope Australia  
Service Address BALDWIN SHELSTON WATERS  
Level 21  
60 Margaret Street  
SYDNEY NSW 2000

## Old Name and Address:

PDL Plastics Limited  
19 Keeling Road,  
Henderson,  
Auckland,  
New Zealand

## New Name and Address:

Alto Plastics Limited  
New Zealand

## FEE HISTORY

Paid Date	Paid to Date	Fee Paid	Payor Code	Reference
	12/12/88			INITIAL PERIOD
21/10/88	12/12/89	70	SF	
14/11/89	12/12/90	100	SF	
17/09/90	12/12/91	120	SF	
23/12/91	12/12/92	160	SF	
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15/01/97	12/12/97	345	SF	
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22/11/99	12/12/00	475	CJ	
20/11/00	12/12/01	525	CJ	
15/11/01	12/12/02	575	CJ	
14/11/02	12/12/03	700	CJ	

## Last Agency Address

COMPUTER PATENT ANNUITIES  
PO Box 778  
Jersey JE1 1BL  
CHANNEL ISLANDS

## PRIORITY DETAILS

Application  
Date Number Country  
13/12/85 PH3865 AUSTRALIA

Related to Provisional Number PH3865

Application Id : 66495 / 86

Serial Number : 602500

IPC Mark	Primary ?
B65D 055 / 06	Y
B65D 041 / 34	

\*\*\*\*\* End of Complete Application \*\*\*\*\*

Application Id : 66495 / 86

Provisonal Number : PH3865

Date Provisional Keyed  
Provisional Filing Date 13/12/85  
Country of origin NEW ZEALAND  
Lodgement fee 60  
Lapsed Flag  
Withdrawn Flag  
International (Type) Search Results

Applicant Name  
PDL Packaging Ltd.  
Address : 19 Keeling Road,  
Henderson,  
Auckland,  
New Zealand

Invention Title  
TAMPER PROOF SEAL FOR A CONTAINER CLOSURE

\*\*\*\*\* End of Associated Provisional \*\*\*\*\*

\*\*\*\*\* End of Listing \*\*\*\*\*

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